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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/448,175	11/24/1999	HANNA S-H HSU	12-0887	4745
7590	11/10/2003			EXAMINER
PATENT COUNSEL			ODOM, CURTIS B	
TRW INC			ART UNIT	PAPER NUMBER
SPACE & ELECTRONICS GROUP			2634	
ONE SPACE PARK E2 6072				
REDONDO BEACH, CA 90278			DATE MAILED: 11/10/2003	

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	09/448,175	HSU ET AL.
	Examiner	Art Unit
	Curtis B. Odom	2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 8/11/03.

2a) This action is FINAL.                    2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) 6 is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-5 and 7-9 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 24 November 1999 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some \* c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

1) Notice of References Cited (PTO-892)                    4) Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)                    5) Notice of Informal Patent Application (PTO-152)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                    6) Other: \_\_\_\_\_

**DETAILED ACTION**

*Information Disclosure Statement*

1. The information disclosure statement filed 11/24/99 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. There are no copies of the non-patent references in the file. Copies of the non-patent references cited in the IDS must be submitted to comply with 37 CFR 1.98(a)(2).

*Election/Restrictions*

2. Claim 6 is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 4.

*Claim Rejections - 35 USC § 112*

3. Claims 1-3, 8, and 9 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 1 and 8 recite the frequency analyzer providing a single output  $x_r$ . However, the frequency analyzer providing a single output  $x_r$  was not described in the specification or the drawings in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 8 rejected under 35 U.S.C. 102(b) as being clearly anticipated by Cariolaro et al. (EP 0 668 679 A2).

Regarding claim 1, Cariolaro et al. discloses a frequency analyzer (Fig. 5) for analyzing a plurality of input signals, wherein the I-DFT produces an analyzed frequency spectrum, thereby meeting the limitation of the device being a frequency analyzer, the frequency analyzer comprising:

a plurality of input modulators (Fig. 5, A, pg. 5, lines 45-51) for modulating and shifting input signals which define shifted output signals, wherein it is inherit that the signals are shifted to be modulated onto the carrier;

a polyphase filter network (Fig. 5, Q(f), pg. 5, lines 52-26) which includes a plurality of polyphase filters for receiving the shifted output signal and defining polyphase filter output signals; and

a plurality of output modulators (Fig. 5, B, pg. 6, lines 3-5) for modulating the output of the polyphase filters, the frequency analyzer configured to synthesize the plurality of input signal and provide a single output signal (Fig. 5, v, pg. 6, lines 10-11).

Regarding claim 8, Cariolaro et al. discloses a frequency synthesizer (Fig. 5) for synthesizing a plurality of input signals, wherein the I-DFT produces an analyzed frequency spectrum, thereby meeting the limitation of the device being a frequency analyzer/synthesizer the frequency synthesizer comprising:

a plurality of input modulators (Fig. 5, A, pg. 5, lines 45-51) for modulating and shifting input signals which define shifted output signals, wherein it is inherit that the signals are shifted to be modulated onto the carrier;

a polyphase filter network (Fig. 5, Q(f), pg. 5, lines 52-26) which includes a plurality of polyphase filters for receiving the shifted output signal and defining polyphase filter output signals; and

a plurality of output modulators (Fig. 5, B, pg. 6, lines 3-5) for modulating the output of the polyphase filters, the frequency analyzer configured to synthesize the plurality of input signal and provide a single output signal (Fig. 5, v, pg. 6, lines 10-11).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cariolaro et al. (EP 0 668 679 A2).

Regarding claim 2, which inherits the limitations of claim 1, Cariolaro et al. discloses multiplying the input signals by  $e^{j2\pi l/N}$ , but Cariolaro et al. does not discloses multiplying the signals by a factor of  $e^{j2\pi lk^m}$  from the output of the I-DFT, where k is a odd/even stacking factor. The I-DFT is just used to convert the input signals to a different format, but the content of the original input signals remains the same. Therefore, it would have been obvious to one skilled in the art that both these equations are used to phase shift an input signal by a certain factor. In the case of the instant application, the shifting factor is k, and in the case of Cariolaro et al., the shifting factor is N. Therefore, phase shifting a signal by a different factor does not constitute patentability.

Regarding claim 3, which inherits the limitations of claim 1, Cariolaro et al. discloses multiplying the output signals of the polyphase filter by  $e^{j2\pi k_{op}/M}$ , but Cariolaro et al. does not discloses multiplying the signals by a factor of  $e^{j2\pi k_{op}/M}$ , where k is a odd/even stacking factor, p

is the channel, and M is the total number of channels. However, it would have been obvious to one skilled in the art that both these equations are used to phase shift an input signal by a certain factor. In the case of the instant application, the shifting factor is k, and in the case of Cariolaro et al., the shifting factor could be N. Therefore, phase shifting a signal by a different factor does not constitute patentability.

Regarding claim 4, Cariolaro et al. discloses a polyphase filter comprising:  
a plurality of filter channels (Fig. 5, Q(f), pg. 5, lines 52-26) for filtering a plurality of input signals;

a complex modulator (Fig. 5, A, pg. 5, lines 45-51) which modulates each input signal by a complex factor, wherein the input signals have been converted to a different format by the I-DFT but contain the same information as the signals inputted to the device ; and

a plurality of output modulators (Fig. 5, B, pg. 6, lines 3-5) for modulating each of the outputs of the plurality of filter channels by a modulation factor.

Cariolaro et al. does not disclose modulating each input signal by a factor of  $(-1)^m$  , where m is the time index. However, Cariolaro et al. discloses multiplying the input signals by  $e^{j2\pi/N}$  and the instant specification states that multiplying the signals by  $(-1)^m$  is equivalent to multiplying the signals by a factor of  $e^{j2\pi km}$ . Therefore, it would have been obvious to one skilled in the art that both these equations are used to phase shift an input signal by a certain factor. In the case of the instant application, the shifting factor is k, and in the case of Cariolaro et al., the shifting factor could be N. Therefore, phase shifting a signal by a different factor does not constitute patentability.

Regarding claim 5, which inherits the limitations of claim 4, Cariolaro et al. discloses multiplying the complex modulation factor is  $e^{j2\pi/N}$ , but Cariolaro et al does not disclose the complex modulation factor is  $e^{j2\pi k p/M}$ , where k is a odd/even stacking factor, p is the channel, and M is the total number of channels. However, it would have been obvious to one skilled in the art that both these equations are used to phase shift an input signal by a certain factor. In the case of the instant application, the shifting factor is k, and in the case of Cariolaro et al., the shifting factor could be N. Therefore, phase shifting a signal by a different factor does not constitute patentability.

7. Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cariolaro et al. (EP 0 668 679 A2) in view of Petranovich et al. (U.S. Patent No. 5, 937, 010).

Regarding claims 7-9, Cariolaro et al. discloses all the limitations of claims 7 and 9 (see previous rejections of claims 1 and 8) except for the input modulators including an inverter and one or more multiplexers for receiving one or more compensation vectors for selectively negating the input signals.

However, Petranovich et al. discloses a data modulator in a communications system (Fig. 5, block 120, and Fig. 9, column 11, lines 51-60) which comprises of an inverter (Fig. 9, block 183) and multiplexers (Fig. 9, blocks 180 and 181) in which vectors are used preceding the modulation section in the device (column 12, lines 40-45). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the modulator of Cariolaro et al. with the modulator of Petranovich et al., since Petranovich et al. states the modulator of his/her device realizes various characteristics of the modulation function using

simplified or less hardware which decreases the size of the implemented circuit and also the cost (column 11, lines 51-60).

***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Curtis Odom  
October 20, 2003



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